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REMARKS

Reconsideration of the present application is respectfully requested. Claims 1-24 and 37-39 were previously canceled. In this amendment, claims 25, 26, 29, 30 and 32 have been amended, and claim 49 has been added. No new matter has been added.

Therefore, claims 25-35 and 40-49 are now pending.

Finality of Office Action is Improper

Applicant respectfully traverses the finality of the present Office Action. The present Final Office Action includes new grounds of rejection, which the Examiner contends were necessitated by Applicants' amendment filed on 6/2/2006 (p. 14 of Final Office Action). However, that contention is clearly incorrect. It is very clear that the amendment filed on 6/2/2006 did *not* alter the scope of any claims or change their substance in any significant way; rather, the amendment was clearly directed *only to minor matters of form*, which were unrelated to the rejections as Applicants clearly explained -- see response filed 6/2/2006, p. 8, last paragraph. Applicants also clearly explained why the claims were patentable over the cited art *even before those changes to the claims* -- see response filed 6/2/2006, p. 9, first paragraph after quoted claim 25; and p. 11, first paragraph after quoted claim 32.

It therefore will be evident to any reasonable person, from reading Applicants' last response, that the new grounds of rejection were *solely in response to Applicants' arguments and not necessitated by the claim amendments*. Consequently, it was improper to make the present Office Action final. Applicants therefore submit that this

amendment should be considered and entered as an amendment after a *non-final* Office Action.

Prior Art Rejections

Claims 25, 26, 28-31, 35, 43, 44, and 46-48 were rejected under 35 U.S.C. § 103(a) based on U.S. Patent no. 6,434,681 of Armangau et al. ("Armangau") in view of U.S. Patent no. 6,175,900 of Forin et al. ("Forin"). Claims 32-34 were rejected under 35 U.S.C. § 103(a) based on Armangau in view of U.S. Patent no. 6,665,815 of Goldstein et al. ("Goldstein").

Applicants respectfully traverse the rejections. As with the previous amendment, the above amendments are submitted only to place the claims in what Applicants consider to be better form. The amendments are *not* made in response to the rejections or to comply with any statutory requirement of patentability, since no such amendments are believed to be necessary (as will be apparent from the discussion below).

Independent claims 25, 35 and 43

Claim 43 recites (as amended):

43. (Currently amended) A method comprising:
maintaining an active map of information indicating in-use blocks and free blocks associated with a file system;
maintaining a plurality of persistent point-in-time images, each persistent point-in-time image representing a state of said file system at a particular point in time; and
generating a summary map as a logical union of active maps included in at least two of said persistent point-in-time images.
(Emphasis added.)

Claim 43 stands rejected under 35 U.S.C. § 103(a) based on Armangau in view of Forin. To support a rejection for obviousness, the cited combination of references must teach or suggest *all of the claim limitations*. *In re Vaeck*, 947 F.2d 488, 20 USPQ.2d 1438 (Fed. Cir. 1991); MPEP § 706.02(j) (emphasis added). Applicants respectfully submit that no combination of Armangau and/or Forin discloses *all of the limitations* of claim 43 or renders the claimed method obvious. Note that claim 43 has been amended only to correct a minor informality, not in response to the rejection.

The Examiner admits that Armangau fails to disclose "as a logical union" (Final Office Action, p. 3). However, the Examiner contends that Forin teaches this feature. The Examiner is mistaken. Regarding Forin the Examiner states, "It should be noted that the two neighboring free blocks has [sic] two pairs of free two-bit values 01, 01 (See Table 1 in col. 7), then, after the step of coalescing (i.e., computing), a single piece of memory is free having a free two-bit value 01, *which is as result [sic] of logical union of 01 and 01*" (Final Office Action, p. 3)(emphasis added).

That is incorrect. Assuming *arguendo* Forin discloses any logic operation to form a summary map, Forin discloses a logical *intersection* operation (i.e., logic AND) when coalescing adjacent free blocks, *not* a logical union (OR) operation. It is a basic principle of Boolean logic that the logical "union" operation is a logic OR, whereas the logical "intersection" operation is a logic AND. In Forin, the only situation in which two adjacent blocks should be coalesced into a single piece of memory is if *both* blocks are free, i.e., *both* of their bitmap values are "01". That is analogous to a logic intersection (AND) operation, *not* a logical union (OR). In contrast, a logical *union* (OR) operation

would produce a result of "01" not only from inputs [01, 01], *but also* from inputs [00, 01]. The latter result would be incorrect in the system in Forin, since value "00" in Forin represents a sub-allocated block (col. 7, lines 37-43), and two adjacent blocks are only coalesced into a single piece of free memory in Forin if they *both* have a bitmap value of "01" (indicating a free block). Thus, assuming *arguendo* Forin discloses using a logic operation to form a summary map, it could only be a logical intersection operation, not a logical union operation as recited in claim 43.

Consequently, neither Armangau nor Forin discloses or suggests *generating a summary map as a logical union of active maps included in at least two of said persistent point-in-time images*. For at least this reason, therefore, claim 43 and all claims which depend on it are patentable over the cited art.

A similar limitation is also present in independent claims 25 and 35. Therefore, claims 25 and 35 are also patentable over the cited art for similar reasons. And, for the above reasons, it should be apparent that the claims were patentable over the cited art even without the above amendments to the claims, and that the above amendments are not in response to or necessitated by the rejections.

Furthermore, the Examiner contends that Armangau discloses "maintaining an active map of information indicating in-use blocks and free blocks associated with a file system" in col. 13, lines 25-65 and col. 13, line 66 to col. 14, line 7 (Final Office Action, p. 6). However, Applicants find no disclosure of an active map of information indicating in-use blocks and free blocks associated with a file system, in the cited sections or

elsewhere in Armangau. Applicant respectfully submits that, if the Examiner maintains this rejection or asserts a similar new rejection, the Examiner is obligated to clarify *exactly what feature in Armangau* the Examiner considers to be an active map as recited in Applicants' claims. "It is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given a fair opportunity to reply." MPEP § 706.02(j).

The Examiner also contends that Armangau discloses "generating a summary map of active maps included in at least two of said persistent point-in-time images" in Fig. 6 and col. 14, line 62 to col. 15, line 18 (Final Office Action, p. 6). However, Applicants find no disclosure of a summary map of active maps included in at least two of said persistent point-in-time images, in the cited sections or elsewhere in Armangau. Applicant respectfully submits that, if the Examiner maintains this rejection or asserts a similar new rejection, the Examiner is obligated to clarify *exactly what feature in Armangau* the Examiner considers to be a summary map of active maps included in at least two of said persistent point-in-time images, as recited in Applicants' claims. "It is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given a fair opportunity to reply." MPEP § 706.02(j).

Independent claim 32

Claims 32 recites:

32. (Currently Amended) A method comprising:
maintaining an active map of information indicating in-use blocks
and free blocks of an active file system;

maintaining a set of snapshots, each snapshot representing a state of said active file system at a particular point in time, each snapshot having a corresponding active map indicating in-use blocks and free blocks of the active file system for a point in time at which said snapshot was generated;

maintaining a summary map based on an active map of at least one of said snapshots;

receiving a request to delete a particular snapshot; and

deleting said particular snapshot, **wherein said deleting involves, for a block used by said particular snapshot, indicating said block is free in said summary map depending on a snapshot just prior to said particular snapshot and a snapshot just after said particular snapshot.** (Emphasis added.)

Claim 32 stands rejected under 35 U.S.C. § 103(a) based on Armangau in view of Goldstein. Applicants respectfully submit that no combination of Armangau and/or Goldstein discloses *all of the limitations* of claim 32 or renders the claimed method obvious. Note that claim 32 has been amended only to place that claim in a form that Applicants prefer, not in response to the rejection, as will be apparent from the discussion which follows.

The Examiner admits that Armangau fails to disclose "wherein said deleting involves, for a block used by said particular snapshot, indicating said block is free in said summary map depending on a snapshot just prior to said particular snapshot and a snapshot just after said particular snapshot" (Final Office Action, p. 9). However, the Examiner contends that Goldstein teaches this feature at col. 4, lines 41-51. The Examiner is mistaken.

Goldstein does disclose deleting a snapshot. However, Applicants find absolutely no disclosure, or even a hint, anywhere in Goldstein, that deleting a snapshot may involve, for a block used by said particular snapshot, indicating said block is free in said summary map depending on a snapshot just prior to said particular

snapshot and a snapshot just after said particular snapshot, as recited in claim 32. Note that this claim limitation was not affected by the above claim amendments. For this additional reason, therefore, claim 32 and all claims which depend on it are patentable over the cited art.

Dependent Claims

In view of the above remarks, a specific discussion of the dependent claims is considered to be unnecessary. Therefore, Applicants' silence regarding any dependent claim is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim.


Conclusion

For the foregoing reasons, the present application is believed to be in condition for allowance, and such action is earnestly requested.

If there are any additional charges/credits, please charge/credit our deposit account no. 02-2666.

Respectfully submitted,
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